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ABSTRACT

A framework for articulating postsecondary instructional programs is described. The framework identifies two important sources of influence on programs: the type of institution within which the program operates and the program objectives. These factors influence both program components and how these components are linked and processes that are characteristic of all programs. Once a program is articulated in this way, it is easier to frame evaluation questions and plan evaluation strategies. Based on case studies of three innovative undergraduate instructional programs at Northwestern University, Illinois, nine structural components were identified: program director, university administrators, faculty, departments, advisory committee, curriculum, students, funding, and facilities. Several processes are cited that characterize programs: participant selection, content development, content delivery, and monitoring delivery. Institutional type affects program structures and processes and also affects the way components are linked in an instructional program. Characteristics of components of the social sciences program mathematical methods at Northwestern University are diagrammed, along with linkages, including the flow of money, people, and communication. Attention is also directed to areas of evaluation affected by the structure and process features: design, measures, and data collection. (SW)

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IDENTIFYING THE CONTEXT OF POSTSECONDARY INSTRUCTIONAL PROGRAMS

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Identifying the context of postsecondary instructional programs is an important step toward framing relevant evaluation questions and planning appropriate evaluation strategies. This context can be described in terms of the program's structures and processes and the factors which influence them.

In the following discussion, a framework for articulating postsecondary programs is described. This framework (illustrated in Figure 1) identifies two important sources of influence on programs: the type of institution within which the program operates and the objectives of the program. These factors influence both (a) program components and how these components are linked together and (b) processes which are characteristic of all programs.

Once a program is articulated in this way, it is easier to frame evaluation questions and plan evaluation strategies. Ultimately, careful program articulation provides the evaluator with a blueprint for checking program implementation and provides future program administrators with a blueprint for replication.

Sources of Influence

This paper focuses on instructional programs, i.e., programs that involve the teaching/learning process. Of particular interest are innovative undergraduate interdisciplinary programs. Such programs include a curriculum represented in a series of courses arranged in some sequence. The curriculum leads to increased knowledge of a specialized substantive area, and in most instances, to a degree or certificate. Instructional programs may have special funding from sources outside the university or from university administrative offices. A program is differentiated from a curriculum in that curriculum refers only to a series of related courses, while program includes such components as faculty and students as well as curriculum.

Based on case studies of three innovative undergraduate instructional programs at Northwestern University, nine structural components have been identified. Although Northwestern University is not representative of all universities, we believe that these components are fundamental units of instructional programs at most postsecondary institutions. As shown in Figure 2, these components are (1) program director, (2) university administrators, (3) faculty, (4) departments, (5) advisory committee, (6) curriculum, (7) students, (8) funding, and (9) facilities. Since these components have widely shared meanings, we will not explain them further. Their interrelationships are explored below.

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We have also identified several processes which we believe characterize all programs (see Figure 1). They are (1) selecting participants, (2) developing content, (3) delivering content, and (4) monitoring delivery.

Institutional Type

Postsecondary institutions have their differences as well as their similarities. Research on these differences (Baldridge et al, 1978) has produced an eight-category typology: private multiversity, public multiversity, elite liberal arts college, public comprehensive college, public college, private liberal arts college, community college, and private junior college.

Institutional type affects program structures and processes. For example, students in a private or public multiversity are generally of higher ability than students in community and junior colleges. This higher ability is also reflected in procedures for admission to the multiversity. Thus, relatively high ability is a characteristic of the student component and the selection process.

Institutional type also affects the way components are linked together in an instructional program. In private and public multiversities, faculty have considerable influence over program development and curriculum content. In junior and community colleges, however, content is greatly influenced by local needs and state mandates, and faculty have less influence over curriculum. In the first instance, faculty are linked to curriculum because they provide direct input into the curriculum. In the second instance, administrators who represent community and state needs, are linked to the curriculum along with faculty. In terms of process, this example illustrates how institutional type may affect development of program content.

Program Objectives

Program objectives also influence the components and linkages in a program. Let us say a program's objective is to provide integrated coursework in both mathematics and selected social sciences. This objective influences the component, departments, by including some and excluding others. This math/social science objective also affects linkages in that program. In this case, departments are linked to faculty. Finally, this interdisciplinary objective has obvious implications for processes, such as developing content.

Structures

Two aspects of structure, namely, components and linkages, deserve illustration.

Components

Institutional type and program objectives influence the specific characteristics of components of any one program. We illustrate with reference to some of the characteristics of components of the Mathematical Methods in the Social Sciences Program at Northwestern University (Figure 3).

Institutional type influences the student component. This program attracts very bright students--students with SAT math scores of 650 or better--because it operates at Northwestern where admissions is highly selective. Program objectives include providing an honors curriculum for high ability students. These objectives manifest themselves in the components of students and curriculum and in the processes of participant selection and content development.

Linkages

Formally defined, a linkage expresses a relationship between components. Linkages are influenced by program objectives and institutional type. Further, linkages can be unidirectional or bidirectional.

Linkages may be thought of as conduits, in particular, conduits for the flow of money, of people, and of communication.

The following diagrams illustrate the types and the directionality of linkages with reference to the Mathematical Methods in the Social Sciences Program. However, diagrams can only approximate the complexities of such relationships. For example, a flow of communication may represent teaching or advising or discussion, but these activities are not differentiated in the diagram. Nevertheless, an evaluator will find it useful to articulate the characteristics of components and the flows of communication which occur between components.

Figure 4 uses dollar signs to represent the flow of money. Money is linked from the funding agency to university administrators (for indirect costs) and to the program director (for direct costs). The MMSS program is also supported by university funds indicated by the linkage between university administrators and the director. From the director, money is channeled to faculty and facilities to pay for services. Each linkage is unidirectional, i.e., the flow goes in only one direction.

Figure 5 illustrates the flow of people. People for faculty, for the advisory committee, and for director are obtained through departments. A bidirectional linkage between faculty and departments reflects both that faculty are provided by departments and that one faculty member was hired specifically for the program but has a department affiliation.

Figure 6 illustrates the flow of communication. Communication is bidirectional between administrators and director, faculty and director, and faculty and students. Communication is unidirectional between curriculum and students, e.g., curriculum is communicated to students but students have virtually no input into the curriculum.

Although linkages have been illustrated individually, they are actually concurrent activities, as indicated in Figure 7 which meshes Figures 4, 5, and 6.

Processes

A postsecondary instructional program is not static; original plans are the seeds from which a program grows as it is put into operation. On-going processes affect program development and contribute to changes in characteristics of components and linkages. We have identified four processes which characterize instructional programs: (1) selecting participants, (2) developing content, (3) delivering content, and (4) monitoring delivery. Some relevant features of each process are shown in Appendix A. These features are present for most innovative undergraduate interdisciplinary programs and, as indicated in our final section, have implications for planning evaluations.

Three features illustrate the process of selecting program participants. In postsecondary institutions, students do not randomly enter programs; their admission is based on criteria related to university-wide admissions policy and to specific program objectives. Many instructional programs admit only small numbers of students for reasons which include 1) limited program funding, 2) program orientation toward providing an intimate learning experience for their students, and 3) student unfamiliarity with newly-established programs. A third feature of the selection process is student attrition from programs. During college, students make many changes; interests crystallize and career directions become more focused. Particularly for programs that begin in the freshman year, it should be expected that some students change their minds about the program or the college and leave.

Four features relate to the process of developing program content. First, newly-established programs do not have a stable curriculum. Curriculum changes are made based on experience during the program's formative years. Second, innovative programs in particular are likely to deal with new material or new ways of presenting material. Content development is oriented toward providing a unique learning experience, including, third, the interdisciplinary organization of content. A fourth feature is the cooperative nature of faculty participation. For many programs, faculty participation is voluntary; programs enlist interested faculty from program-related departments.

Three features concern the process of delivering program content. First, faculty do not remain constant in programs. Especially when participation in the program is voluntary, faculty may change from year to year based on their departmental responsibilities. Another feature concerns the inconsistent documentation of course content. The usual documentation of course content is the syllabus, but not all faculty prepare syllabi. Thus, evaluators are handicapped in determining what "instruction" has been delivered. Third, delivery of content is subject to the time constraints of the postsecondary institution in which it operates. Time constraints refer to semesterly or quarterly term arrangements.

The final features illustrate the process of monitoring delivery of content. We note three features present at most postsecondary institutions that are available to help monitor programs. These include, first, student evaluations of courses, second, student demographic data (e.g., GPA, high school rank) available from admissions and registrar offices, and, third, institutional research data on student attitudes toward their campus experiences. These data are available at little or no cost and can be useful in assessing instruction, student performance and student well-being.

Implications for Designing Evaluations

The dynamic nature of postsecondary program operations requires that the evaluator be sensitive to program changes from the time of planning to the time of operation. Specific areas of evaluation affected by the structure and process features discussed above include design, measures, and data collection.

Design

The design issue of control groups can be illustrated with reference to the selection process. Since programs admit students using specified criteria, randomization of experimental groups is difficult. A large pool of admissible students would permit randomization; yet, publicity for a new program may be sparse and some students are hesitant about entering an "experimental" program. Therefore, there is likely to be only a small pool of students from which to draw.

More controlled selection procedures might be recommended to program directors. But many directors are not familiar with such procedures as the regression discontinuity design and are therefore not likely to use them. Without randomization as an option, an evaluator interested in using quantitative methodology must devise comparison groups using a quasi-experimental design. Choosing appropriate comparison groups is particularly hard when the program has a uniquely interdisciplinary orientation.

Measures

The choice of evaluation measures is made difficult by the very features which make a program distinctive. It is preferable to use standardized measures with norms and established reliability and validity. (For examples of standardized measures of college environments, learning styles, and campus experiences, see Pace, 1975; Bess, 1979; and Lehmann, 1981)

Some standardized measures provide data on psychological outcomes relating to programs or student perceptions of faculty, but they are not appropriate for direct assessment of objectives which relate to unique learning experiences or to the program's interdisciplinary orientation. The evaluator faces a dilemma: to tailor tests to the instructional situation at the risk of limiting comparability with other programs, or to use a standard measure which may not adequately assess program characteristics.

Data Collection

Data collection may be constrained by characteristics of the process we have termed delivering content. One such characteristic is the time constraints under which postsecondary institutions operate. Students begin new coursework with each term as well as with each new academic year. At a term's end, they leave for vacations or graduate. Data collection must be scheduled with these time constraints in mind.

Not all characteristics create problems which undermine data collection. Collection is facilitated by data banks housing student demographic data, student ratings of courses, and student attitudes toward their college ex-

perience. Much supplemental information can be gained in this way for relatively little or no cost.

Summary

In summary, we have attempted to identify the context of postsecondary instructional programs. We believe that the framework presented here is helpful for articulating programs and that such articulation can lead to better evaluation questions and more sound evaluation strategies.

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Appendix A: Processes of Postsecondary Instructional Programs

1.) Selecting Participants

- a) Students are admitted based on university and program admission criteria.
- b) Student attrition occurs.
- c) Small numbers of students may be admitted.

2.) Developing Content

- a) The curriculum may be still developing.
- b) Programs are designed to provide a unique learning experience.
- c) Faculty work on a cooperative basis.
- d) An interdisciplinary orientation is provided.

3.) Delivering Content

- a) Different faculty may be affiliated with the program from year to year.
- b) Course content is not always documented.
- c) Postsecondary institutions impose certain time constraints.

4.) Monitoring Delivery

- a) Student evaluations can assess courses and instructors.
- b) Campus student demographic data can assess student performance.
- c) Campus institutional research data can assess student attitudes toward educational experience.

Figure 1. The Framework

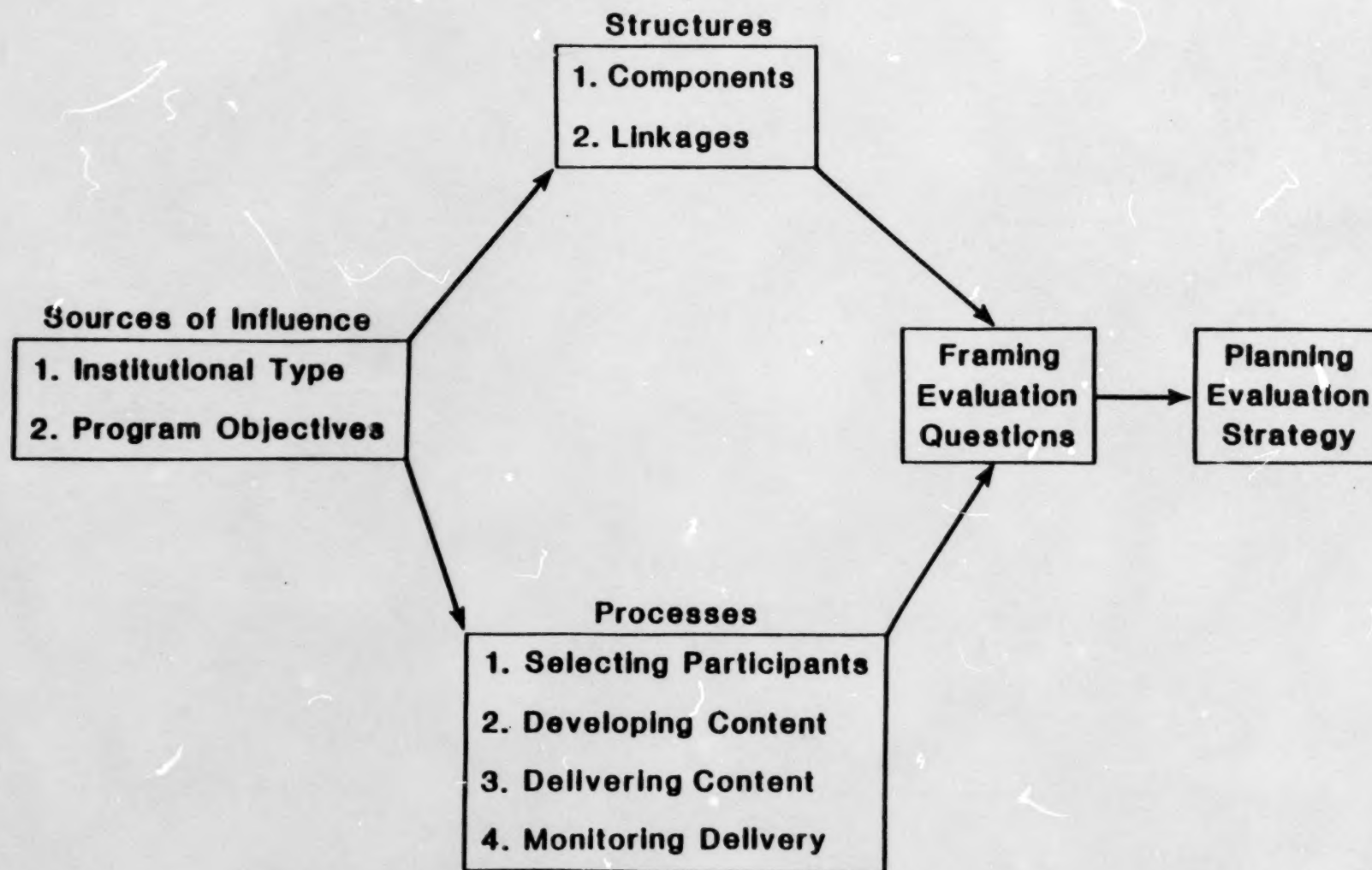
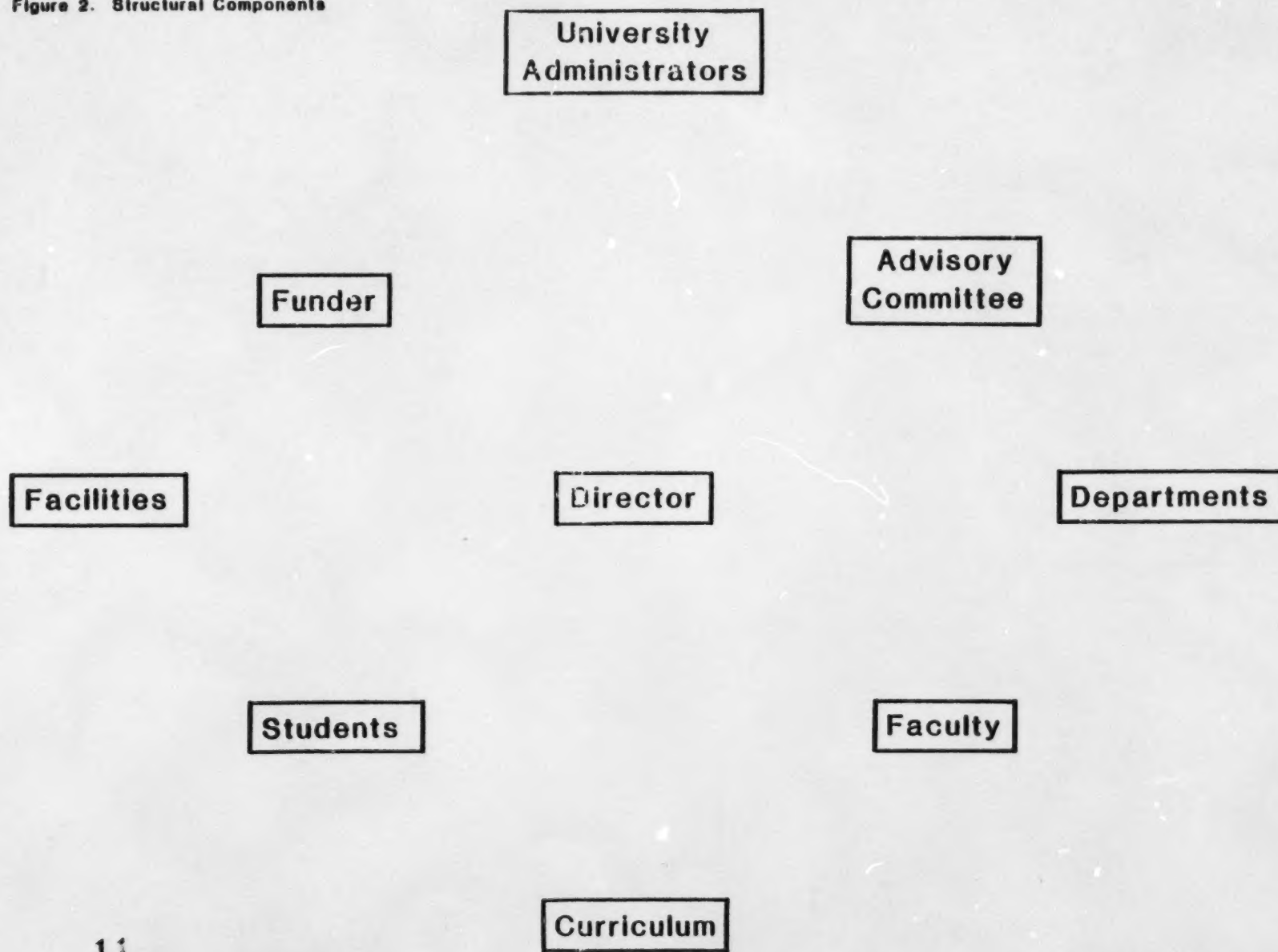


Figure 2. Structural Components



University Administrators

1. V.P. for Research and Sponsored Programs
2. Dean of CAS

1. External agency
2. Federal

1. External agency
2. Federal

1. Lounge
2. Classrooms
3. Computers

1. Lounge
2. Classrooms
3. Computers

1. Expertise in economics
2. Mathematical modelling orientation

1. Expertise in economics
2. Mathematical modelling orientation

1. Expertise in psychology, political science, sociology, anthropology, economics, mathematics, geography

- 1. Expertise in psychology, political science, sociology, anthropology, economics, mathematics, geography**

1. Economics
2. Geography
3. Sociology
4. Psychology
5. Political Science
6. Mathematics
7. Anthropology

1. Economics
2. Geography
3. Sociology
4. Psychology
5. Political Science
6. Mathematics
7. Anthropology

1. High math ability:
SAT 650 plus
2. High verbal ability:
SAT 650 plus
3. Upper ranks of high school class

1. High math ability:
SAT 650 plus
2. High verbal ability:
SAT 650 plus
3. Upper ranks of high
school class

1. Expertise in economics, geography, psychology, sociology, political science, mathematics, & anthropology
2. Mathematical modelling orientation

1. Expertise in economics, geography, psychology, sociology, political science, mathematics, & anthropology
2. Mathematical modelling orientation

1. Integration of mathematics and the social sciences
2. Honors
3. Accelerated pace

1. Integration of mathematics and the social sciences
2. Honors
3. Accelerated pace

Figure 4. Money Linkages

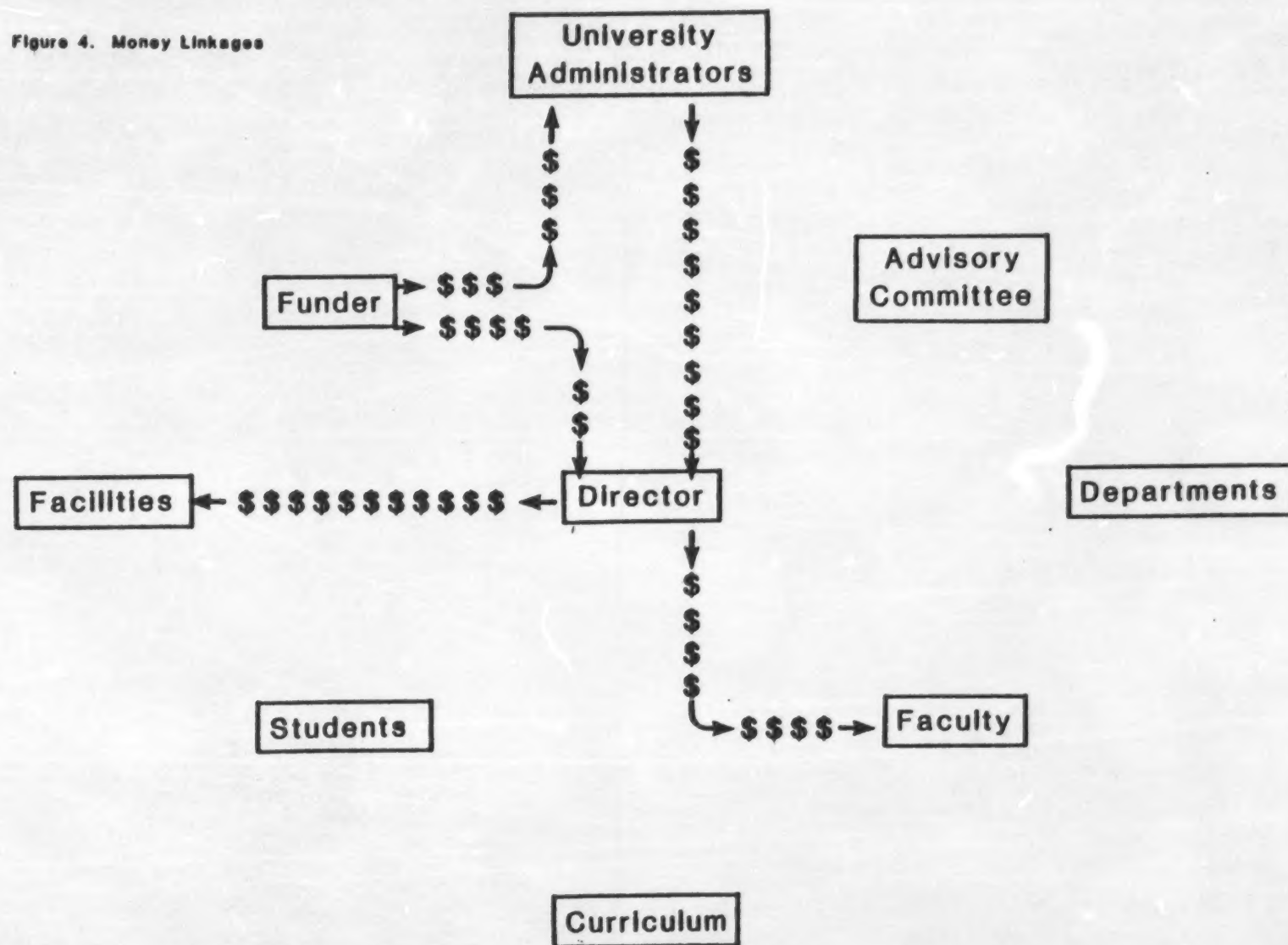


Figure 5. People Linkages

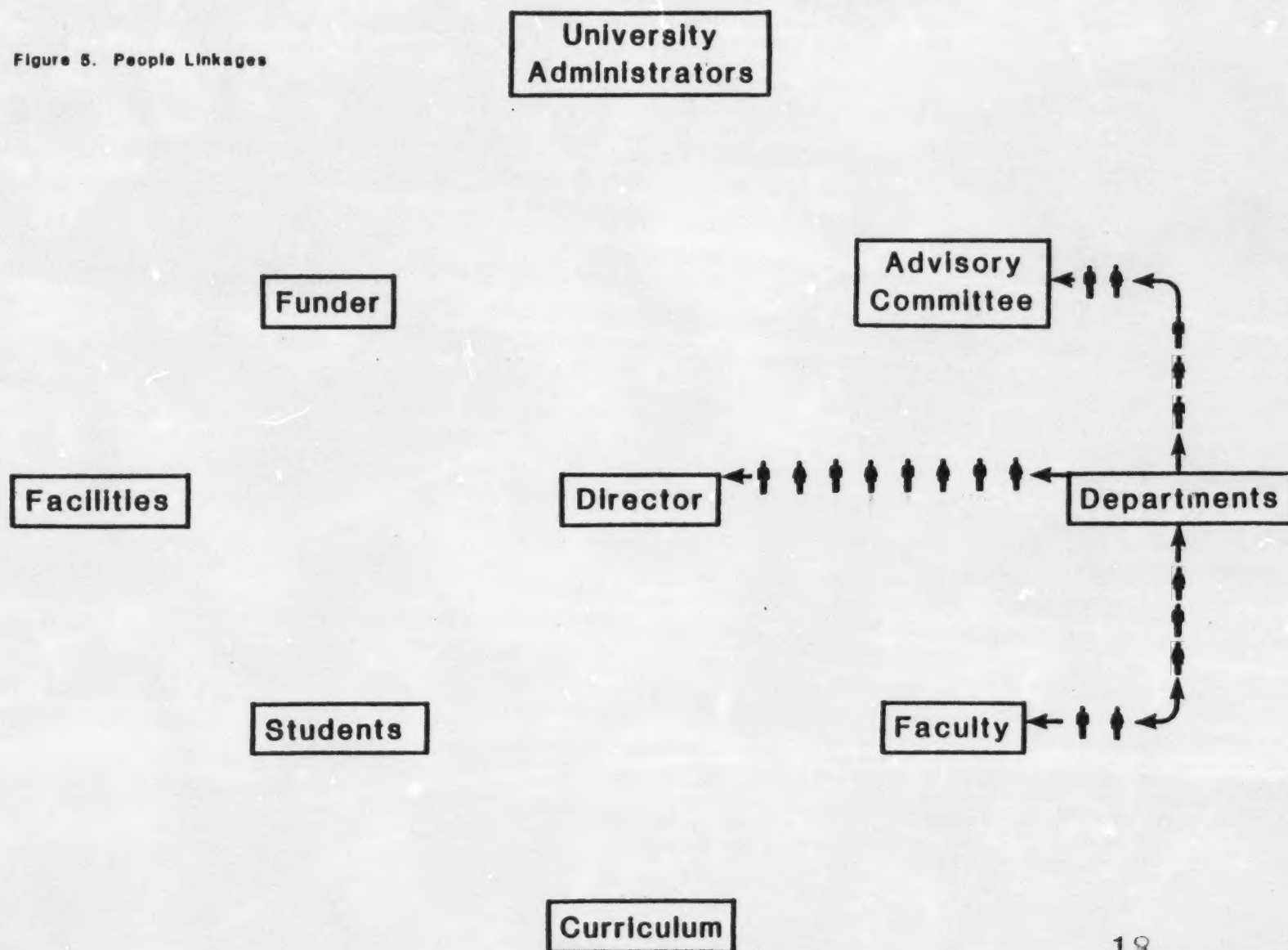


Figure 6. Communication Linkages

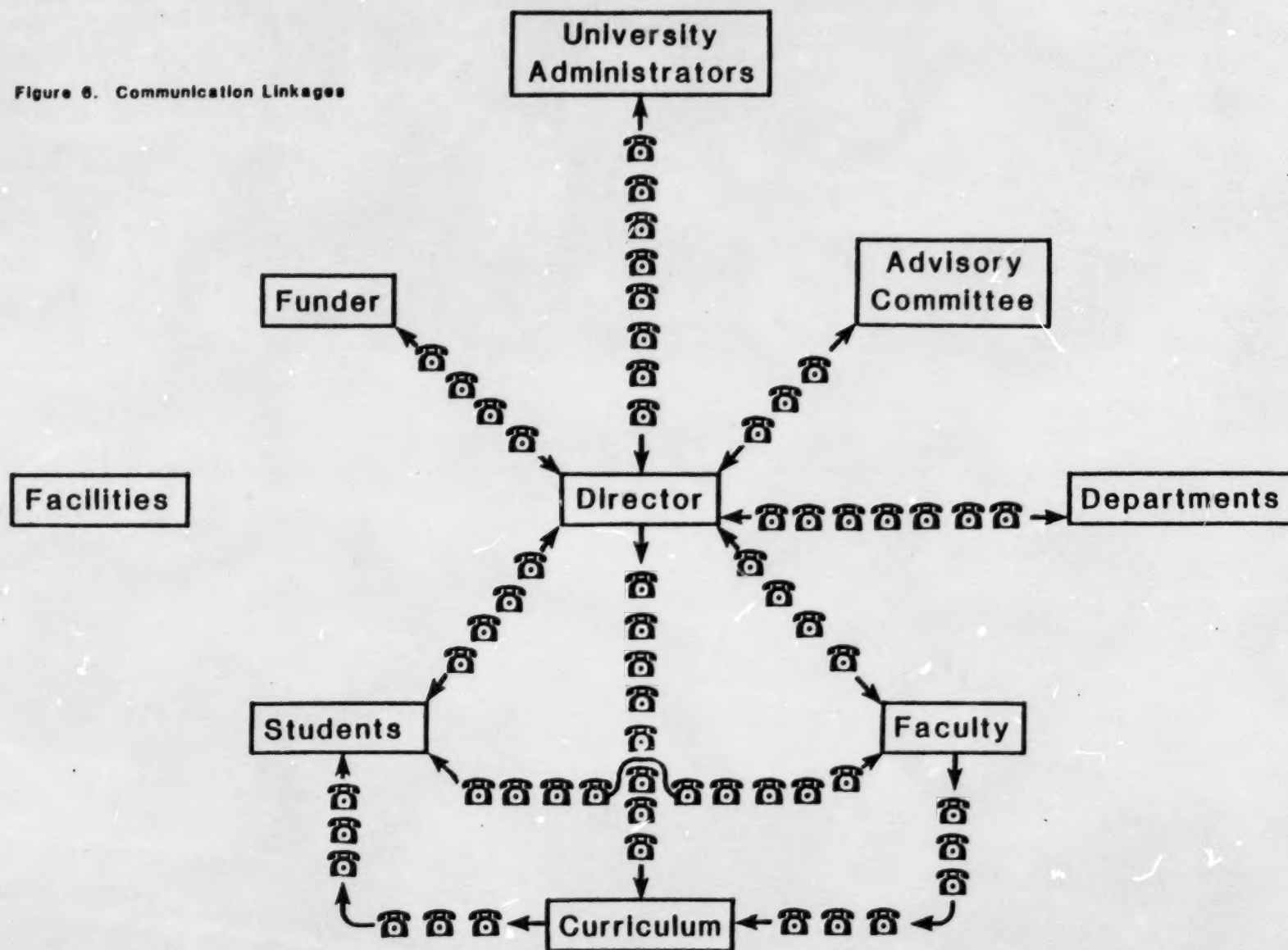


Figure 7

